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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,395	03/01/2002	Belgacem Haba	9797-081-999	7807

24341 7590 03/19/2004

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EXAMINER

ALCALA, JOSE H

ART UNIT PAPER NUMBER

2827

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/087,395

Applicant(s)

HABA, BELGACEM

Examiner

José H Alcalá

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) 15-56 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14, 57 and 58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election with traverse of Group 1, Species 2 in Paper No. 1003 is acknowledged. The traversal is on the ground(s) that Species 1 and Species 2, are just one specie, since Figure 1 is merely a close up of the substrate of the semiconductor module of Figure 2.

This is not found persuasive because, as seen in page 5, lines 27 and 28 of the Specification, in the Brief Description of the drawings, Figure 2 is described as: "a side view of an embodiment of a semiconductor module **according to another embodiment of the invention**". In addition, Page 7, lines 29-31, recite that the embodiment of Figure 2: "includes a substrate 202 **similar** to the substrate 100 shown and described in relation to Figure 1". It is pointed out that while the substrate 202 may be **similar** to the substrate of Figure 1, they do not have to be exactly the same. Furthermore, the embodiment of Figure 2 includes a semiconductor die attached to the substrate by solder balls, electrical contacts and a female connector, all of which are not present in the embodiment of Figure 1, thus making both embodiments different and separate Species.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 15-56 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species and invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election)

requirement in Paper No. 1004. Newly presented claims 44-56 are not readable on the elected species, therefore they are withdrawn from consideration. The limitation that the substrate comprises: "at least two legs joined by a resilient bend", is not drawn to Species 2.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4,8,10-14,57,58 are rejected under 35 U.S.C. 102(b) as being anticipated by Gregory (US Patent No. 4,858,073).

Regarding Claim 1, Gregory teaches a semiconductor module (device of Figure 6) comprising: a substrate comprising: a base layer (reference number 34) having a substantially planar base layer first surface (bottom surface of 34) opposing a substantially planar base layer second surface (top surface of 34), where said base layer first surface is exposed to atmosphere (see Figure 6) and where said base layer is electrically conductive, an insulator layer (reference numbers 40) having a substantially planar insulator layer first surface (bottom surface of reference number 40) opposing a substantially planar insulator layer second surface (top surface of reference number 40), where said base layer second surface and said insulator layer first surface are adjacent and contiguous to one another (see Figure 6) and where said insulator layer is

electrically non-conductive; and a conductive layer (reference number 23) having a substantially planar conductive layer first surface (bottom surface of 23) opposing a substantially planar conductive layer second surface (top surface of 23), where said insulator layer second surface (top surface of reference number 40) and said conductive layer first surface (bottom surface of 23) are adjacent and contiguous to one another (see Figure 6) and where said conductive layer is electrically conductive; at least one semiconductor (reference number 49) adjacent to said conductive layer second surface (top surface of 23), where said at least one semiconductor is electrically coupled to said conductive layer; and electrical contacts (reference number 45) adjacent to said conductive layer second surface, said electrical contacts electrically coupled to said conductive layer (see Figure 3).

Regarding Claim 2, Gregory teaches that said semiconductor and said electrical contacts are disposed at opposing ends of said substrate (see Figures 6 and 7, where the contacts 45 are at the left of the substrate and the semiconductor is located further to the right).

Regarding Claim 3, Gregory teaches that said semiconductor and said electrical contacts are disposed in substantially the same plane as one another (see Figure 7).

Regarding Claim 4, Gregory teaches that said base layer is substantially thicker than said insulator and conductive layers (See figure 6).

Regarding Claim 8, Gregory teaches in Figure 2, that the conductor layer thickness is 0.0007 in (column 5, lines 28-29) and that the insulation layer (combination

of reference numbers 40 and 41) can be 0.0008 in (column 5, lines 36-37), therefore said insulator layer is thicker than said conductive layer.

Regarding Claim 10, the limitation that: "said insulator layer is chosen to provide a predetermined electrical impedance", is an intended use limitation. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987).

Regarding Claim 11, Gregory teaches that said base layer is made from a metal selected from a group consisting of: copper, bronze, stainless steel, and aluminum (column 4, line 22).

Regarding Claim 12, Gregory teaches that said insulator layer is made from a material selected from a group consisting of: a polyimide (column 5, line 19), an epoxy, and teflon.

Regarding Claim 13, Gregory teaches that said conductive layer is made from a metal selected from a group consisting of: copper (column 4, line 15), bronze, and gold.

Regarding Claim 14, Gregory teaches that said conductive layer forms patterned traces (see Figure 7).

Regarding Claim 57, Gregory teaches that said base layer is configured to dissipate heat (column 4, line 21).

Regarding Claim 58, the limitation that: "said base layer is configured to discharge electric charge", is an intended use limitation. It has been held that a

recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ F.2d 1647 (1987).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-7,9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gregory (US Patent No. 4,858,073).

Regarding Claim 5, Gregory teaches all of the elements as stated supra for Claim 1 and further teaches that the base layer is thicker than the insulator layer (column 5, lines 23-41 and Figure 6), but fails to explicitly teach that the ratio of a thickness of said base layer to said insulator layer is approximately 3. It is well known in the art to change the thickness of the substrate of a circuit board in order to decrease or increase flexibility. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to teach that the ratio of a thickness of said base layer to said insulator layer is approximately 3, in order to reduce flexibility of the semiconductor module. In addition, it has been held that discovering an optimum value

of a result effective variable involves only routine skill in the art. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding Claim 6, Gregory teaches all of the elements as stated supra for Claim 1 and further teaches that the base layer is thicker than the conductive layer (column 5, lines 23-41 and Figure 6), but fails to explicitly teach that the ratio of a thickness of said base layer to said conductive layer is approximately 14. It is well known in the art to change the thickness of the substrate of a circuit board in order to decrease or increase flexibility. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to teach that the ratio of a thickness of said base layer to said conductive layer is approximately 14, in order to reduce flexibility of the semiconductor module. In addition, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding Claim 7, Gregory teaches all of the elements as stated supra for Claim 1 and further teaches that the base layer is thicker than the conductive layer and the insulation layer (column 5, lines 23-41 and Figure 6), but fails to explicitly teach said base layer is approximately between 100 and 500 micrometers thick. It is well known in the art to change the thickness of the substrate of a circuit board in order to decrease or increase flexibility. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to make said base layer being approximately between 100 and 500 micrometers thick, in order to reduce flexibility of the semiconductor module. In addition, it has been held that

where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. See *In re Aller*, 105 USPQ 233.

Regarding Claim 9, Gregory teaches all of the elements as stated *supra* for Claim 1 and further teaches as stated *supra* for claim 8, that the insulation layer (combination of reference numbers 40 and 41) can be 20 micrometers thick (column 5, lines 36-37, but fails to explicitly teach that said insulator layer is approximately between 25 and 100 micrometers thick. It is well known in the art to change the thickness of the substrate of a circuit board in order to decrease or increase flexibility. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to make said insulator layer be approximately between 25 and 100 micrometers thick, in order to reduce flexibility of the semiconductor module. In addition, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. See *In re Aller*, 105 USPQ 233.

### ***Conclusion***

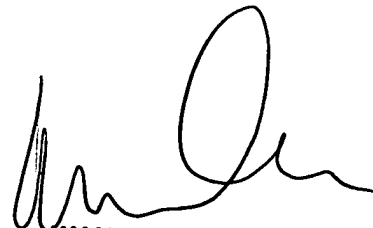
7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references teach some of the elements of the instant claimed invention: Furusawa (US Patent No. 6,384,343), Wilson (US Patent No. 4,890,157) and Chen et al. (US Patent No. 5,156,710).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to José H Alcalá whose telephone number is (571) 272-1926. The examiner can normally be reached on Monday to Friday, first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JHA  
3/15/04



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